

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2021 ANNUAL REPORT

PROJECT: 170

Project Title

Development of a Centralized PIT Tag Database for the San Juan and Upper Basin Recover Programs, 2020-2024

Bureau of Reclamation Agreement Number:

R20AP00027

Project/Grant Period:

Start date: 06/01/2020

End date: 12/31/2024

Reporting period end date: 09/30/2021

Is this the final report? Yes _____ No X

Principal Investigator:

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Abstract:

The Colorado Natural Heritage Program (CNHP) at Colorado State University developed an online data system (the Species Tagging, Research and Monitoring System or STReAMS) for the Bureau of Reclamation and the Upper Colorado and San Juan River Endangered Fish Recovery Programs. The database is designed to track PIT tags and endangered fish activities in the Upper Colorado River Basin. The data system can be accessed at streamsystem.org (registration is required). CNHP continues to host and maintain the data system and work with Database Managers to address Recovery Program priorities.

Study Schedule:

FY20-FY24

Relationship to RIPRAP:

General Recovery Program. Conduct interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program.

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Accomplishment of FY 2021 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Deliverables thus far include an enhanced version of the website at <https://streamsystem.org>. CNHP was short-staffed due to the departure of our web programmer. This position was vacant for 6 months and is now currently filled. Additionally, new computer hardware is delayed. Due to these shortcomings, there are still essential tasks to complete, the most important of which is to purchase a new server and upgrade the MS SQL software, along with rebuilding the test environment.

A list of completed tasks for FY21 is below.

Task 1: Server Maintenance

- Maintained Server and performed Windows updates
- Performed regular back-ups and analyzed back-up file and log sizes
- Replaced failing hard drive
- Troubleshoot and fix database connection issues from windows update in January 2021
 - Adjusted database connection email alerts

Task 2: Website Maintenance, Feature Enhancements and Program Priorities

- Upgraded to PHP 8 and modified web code as needed
 - Tested test website and pushed changes live
 - Monitored log file for PHP errors and warnings
 - Fixed batch uploads bug from PHP upgrade
 - Fixed Browse encounters filter bug from PHP upgrade
- Added button to resubmit all rejected PIA records at once
 - Resubmitted rejected records for PNM Weir that were imported (and rejected) before two newly installed antennas were added to database
- STReaMS internal documentation updates
- Investigated high CPU usage and cleared suspended jobs
- Created FTPS folders to receive data files for new Biologic PIAs and submitted to Biomark
 - Added new arrays to STReaMS
 - Communications with Biomark staff to acquire data files for new units
- Worked with Biomark to recover lost PIA data records on all biologic units after a Biomark reset; this was needed to ensure that a full data history is maintained in data file
- Refreshed test website data periodically for read only access through R
- Trained new CNHP web developer and set up development environment and version control
- Upgraded Google Analytics tag
- Participated in Upper Colorado River Recovery Program Database Manager hiring committee
- Set up Wordpress multi-site for recovery program websites
- Mentimeter

Task 3: Project Management

- Annual reporting
- Proposal updates to adjust years 3-5 of budget and new scope of work
- CSU administrative requirements

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Additional noteworthy observations:

As of November 17, 2021 the database has:

- 1,972,624 PIT Tags
- 1,424,513 Individual Fish
- 3,716,029 Encounters

Between October 1, 2020 and September 30, 2021, Google Analytics show:

- 22,647 page views
- 4,476 sessions
- Average session duration of 4:26 minutes
- Average of 5.06 pages per session
- Bounce Rate of 44.39%

Recommendations:

Server maintenance and code upgrades will continue to be the responsibility of CNHP. Recommendations under the FY20-24 agreement are listed below. CNHP will continue to work closely with Database Managers to adapt to emerging needs.

CNHP will continue to maintain the STReaMS database and enhance existing features during the Federal FY20-24. Tasks are broken out below.

Task 1: Server Maintenance

- Maintain the server, server security, and perform regular database backups
- Maintain the test server and development environment
- Perform necessary software installs and upgrades including Windows operating system, Windows updates, MS SQL Server, MS TFS, and PHP. Ensure all code performs as expected following updates.
- Assess overall performance and optimize resources
- Maintain Database Manager credentials to access SQL Server
- Replace hardware (e.g. server, hard drives, RAM, etc.) as needed and configure new hardware

Task 2: Website Maintenance and Feature Enhancements

- Enhancements to existing tools as funding allows
 - Batch uploads
 - QC tools
 - Calculated fields
- Work with key recovery program staff to ensure complete PIA data in STReaMS
 - Shift units from Loggernet process to new Biologic FTPS upload process as they are upgraded
 - Needs assessment and training with key staff
 - Add and remove PIAs to the automatic upload system as needed
- Work with Database Managers to develop any necessary custom queries, including non-tagged fish queries
- Bug fixes
- Internal testing and stress tests
- Update online help, data dictionary, user manuals, Data Managers user guide, and system documentation
- Train Recovery Program participants on features and enhancements

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

- Support hosting for Recovery Program website
- Other priorities identified by Recovery Program Database Managers

Task 3: Project Management

- Prepare annual reports
- Perform project management and CSU compliance
- Maintain regular communication with Database Managers
- Ensure CNHP staff are fully trained on database design and tasks

Task 4: Develop Direct Database Upload System for PIA Data to Enhance Security, Reliability, and Resiliency (FY22)

- Work with Biomark to determine the computer infrastructure needed for direct database access
- Create table (or bin) in STReaMS to receive raw data from PIAs
- Revise upload methodology
 - Crosswalk unit names between organizations
 - Record import tracking
 - Problem records (stuck tags, etc.)
 - Rejected records
 - Data retention
- Write PIA upload code to import raw data bin into the main STReaMS database (Tags, Fish, Encounters)
 - Maintain current code for data files (if needed for old files, units not on Biologic system, etc.)
- Gather existing PIA data files, format, and import to a bin so available raw data are in a central location
- Update web interface and email notifications to align with the new import process
- Testing
- Dismantle existing FTPS site

FY21 includes the purchase and installation of a new server to run the database and website.

FY22 includes Task 4 to develop the direct database upload system for PIA data.

Project Status:

Ongoing

FY 2021 Budget Status

Funds expended are estimates only. Official financial information comes from CSU Sponsored Programs. Budget had a delayed start date of 3/25/2021.

Funds Provided: \$41,020

Funds Expended: \$15,468

Difference: \$25,552

Percent of the FY 2021 work completed, and projected costs to complete: approx. 38% work completed, estimate \$25,552 to complete

Recovery Program funds spent for publication charges: \$0

Status of Data Submission

Not Applicable

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Signed:

Amy Greenwell
Principal Investigator
11/17/2021